

REMARKS

Claims 1-12 remain in this application. Claims 1, 5 and 12 have been amended to improve readability. Claims 1, 3, 4, and 8-12 were rejected as obvious over Todokoro et al. in view of Kakibayashi et al. To reject claims 2 and 5-7, the Examiner added Shinichi et al. to this combination. Applicants respectfully traverse these rejections.

A characteristic feature of the present invention that distinguishes it from the prior art is in improving resolving power, while simultaneously making the depth of focus large. Thus, for example, in claim 1 there is claimed "a passage aperture for limiting the passage of the charged-particle beam is located between the charged-particle source and said scanning deflector, and in that a member for limiting the passage of the charged-particle beam is provided at least in the center of said passage aperture." (Emphasis supplied.) On the other hand, as recognized by the Examiner, in Todokoro et al. there is no description relating to a member for limiting the passage of the charged-particle beam provided at least in the center of passage aperture.

To supply the missing teaching, the Examiner turns to Kobayashi et al. In Fig. 20 etc. of Kobayashi et al., in order to detect scattered electrons having a special half-opening angle passing through the specimen 403, "a means for limiting the passage" is provided. However, "the means for limiting the passage" is used for improving a resolving power and but not for making the depth of focus large.

As explained in the specification of the present invention, these two aspects of improving the resolving power and making the depth of focus large are in an antithetical relation. That is, the narrower the charged-particle beam is controlled so as to improve the resolving power, however, the depth of focus usually becomes to be small. In order to improve this problem in the present invention, a passage aperture having a member limiting the passage of the beam in the center of the aperture is provided and a charged-particle beam having a special half-opening angle is provided so as to focus on the sample.

In Kobayashi, the element 409 mentioned by the Examiner is located on the other side of the sample. Limiting the beam passing through the center of an aperture, after passing the sample, is not what is claimed and it does not attain the effect of the present invention. Thus,

there is no teaching or suggestion that substituting the element 409 into Todokoro et al. would lead to the results desired by Applicants. Even looking at the Examiner's reasons for motivation this can be seen; those reasons are different and apply to use of an aperture such as 409 in the detection path on the other side of the sample.

Furthermore, in Todokoro, the elements 28 and 29 are not means to form a special beam having the special half-opening angle as in the present invention.

In summary, in Kobayashi and Todokoro, clearly difference technical features from those of the present invention are disclosed and there is no suggestion of disposing a passage aperture having a member for limiting the beam in passing the center of the aperture between the charged-particle source and said scanning deflector.

Shinichi (JP 2000-12454) does not make up for the deficiencies in these two references. In it, an electron beam exposure apparatus has an electron beam 100 emitted from the electron beam source 30 and irradiated on a mask 1 passing through a zonal illumination aperture 11 with the mask image focused on the photosensitive substrate 2.

However, in the electron beam exposure apparatus disclosed in Shinichi, since the electron beam is irradiated on a special domain of the mask 1 and the image, after passing through this domain, is focused on the photosensitive substrate. As a result, it does not include a scanning deflector and a device to focus a narrow beam on the sample is not provided. Therefore, when the beam is controlled to be narrower, there is no technical problem, as with the present arrangement. Consequently, this reference can make no suggestions regarding the presently claimed solution to the problems faced by the inventors in the present application.

In view of the above, all claims are now in condition for allowance, prompt notice of which is respectfully solicited.

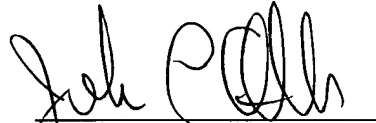
The Examiner is invited to call the undersigned at (202) 220-4200 to discuss any information concerning this application.

Applicants respectfully request a one-month Extension of Time to respond to the Office Action of January 17, 2003. The extended period expires May 19, 2003.

The Office is hereby authorized to charge the fee of \$110.00 for a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) and any additional fees under 37 C.F.R. § 1.16 or § 1.17 or credit any overpayment to Deposit Account No. 11-0600.

Respectfully submitted,

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